

What is claimed is:

1. A method of testing for an allergic disease, said method comprising the steps of:

5 (a) measuring the expression level of NOR-1 receptor protein or a gene encoding the protein in eosinophil cells of a test subject; and

(b) comparing the expression level with that in eosinophil cells of a healthy subject.

10 2. The testing method of claim 1, wherein the gene expression level is measured by cDNA PCR.

15 3. The testing method of claim 1 or 2, wherein the allergic disease is atopic dermatitis.

20 4. A reagent for testing for an allergic disease, said reagent comprising an oligonucleotide that has a length of at least 15 nucleotides and comprises a nucleotide sequence complementary to a polynucleotide encoding an NOR-1 receptor protein or to its complementary strand.

25 5. A method of detecting the influence of a candidate compound on the expression level of a polynucleotide of (a) or (b) below, wherein said method comprises the steps of:

(1) contacting the candidate compound with a cell that expresses a polynucleotide of (a) or (b):

(a) a polynucleotide encoding an NOR-1 receptor protein; and

30 (b) a polynucleotide encoding a protein whose expression in eosinophils increases in association with the decrease of eosinophils in the remission stage of atopic dermatitis, wherein said polynucleotide hybridizes under stringent conditions with a polynucleotide encoding an NOR-1 receptor protein; and

35 (2) measuring the expression level of the polynucleotide (a) or (b).

6. The method of claim 5, wherein the cell is a leukocyte cell line.

7. A method of detecting the influence of a candidate compound on the expression level of a polynucleotide of (a) or (b) below, wherein said method comprises the steps of:

(1) administering the candidate compound to a test animal; and
(2) measuring, in the eosinophil cells of the test animal, the expression intensity of a polynucleotide of (a) or (b):

(a) a polynucleotide encoding an NOR-1 receptor protein; and
(b) a polynucleotide encoding a protein whose expression in eosinophils increases in association with the decrease of eosinophils in the remission stage of atopic dermatitis, wherein said polynucleotide hybridizes under stringent conditions with a polynucleotide encoding an NOR-1 receptor protein.

8. A method of screening for a compound that increases the expression level of the polynucleotide (a) or (b), wherein said method comprises the steps of detecting the influence on the expression level by the method of any one of claims 5 to 7, and selecting a compound that increases the expression level compared to a control.

9. A method of detecting the influence of a candidate compound on the expression level of a polynucleotide encoding an NOR-1 receptor protein, wherein said method comprises the steps of:

(1) contacting a candidate compound with a cell or cell extract containing a DNA having a structure such that the transcription regulatory region of a gene encoding an NOR-1 receptor protein and a reporter gene are operably linked; and

(2) measuring the activity of the reporter gene.

10. A method of screening for a candidate compound that increases the expression level of a gene encoding an NOR-1 receptor protein, wherein said method comprises the steps of detecting the influence of a compound on the activity by the method of claim 9, and selecting a compound that increases the activity compared to a control.

11. A method of screening for a candidate compound for a therapeutic agent for an allergic disease, wherein said method comprises the steps of:

- (1) contacting a test compound with an NOR-1 receptor protein;
- 5 (2) measuring the binding activity between the test compound and the NOR-1 receptor protein; and
- (3) selecting a compound that binds to the NOR-1 receptor protein.

10 12. A method of screening for a candidate compound for a therapeutic agent for an allergic disease, wherein said method comprises the steps of:

- (1) providing cells transfected with (a) a DNA that can express a fusion protein of an NOR-1 receptor protein or its ligand binding domain and a transcription regulatory region binding protein, and
- 15 (b) a DNA having a structure such that a reporter gene is operably linked downstream of a DNA sequence to which the transcription regulatory region binding protein binds;
- (2) contacting the cell with a test compound;
- 20 (3) measuring the activity of the reporter gene; and
- (4) selecting a compound that changes the activity.

13. A therapeutic agent for an allergic disease, said agent comprising, as an active ingredient, a compound obtainable by the screening method of any one of claims 10 to 12.

14. A therapeutic agent for an allergic disease, said agent comprising, as an active ingredient, a prostaglandin having a cyclopentenone structure, which is obtainable by the screening method of any one of claims 10 to 12.

15. A therapeutic agent for an allergic disease, said agent comprising, as an active ingredient, a ligand of an NOR-1 receptor.

16. The therapeutic agent for an allergic disease of claim 15, wherein the ligand of an NOR-1 receptor is a prostaglandin having a

cyclopentenone structure.

17. The therapeutic agent for an allergic disease of claim 16, wherein the prostaglandin having a cyclopentenone structure is selected from the group consisting of prostaglandin A₂, prostaglandin A₁, 16,16-dimethyl prostaglandin A₂, 15(R)-15-methyl prostaglandin A₂, 16-phenoxy tetranor prostaglandin A₂, 17-phenyl trinor prostaglandin A₂, 15-deoxy-delta 12,14-prostaglandin J₂, and 8-iso prostaglandin A₁.

18. The therapeutic agent for an allergic disease of claim 15, wherein the ligand of an NOR-1 receptor is any one of the compounds listed in Tables 14 to 58.

19. The therapeutic agent for an allergic disease of any one of claims 13 to 18, wherein the allergic disease is atopic dermatitis.

20. An animal model for an allergic disease, wherein the animal model is a transgenic non-human vertebrate wherein the expression intensity of polynucleotide (a) or (b) below is decreased in eosinophil cells:
(a) a polynucleotide encoding an NOR-1 receptor protein; and
(b) a polynucleotide encoding a protein whose expression in eosinophils increases in association with the decrease of eosinophils in the remission stage of atopic dermatitis, wherein said polynucleotide hybridizes under stringent conditions with a polynucleotide encoding an NOR-1 receptor protein.

21. The animal model of claim 20, wherein the transgenic animal is a knockout animal.

22. A method of inducing apoptosis of a cell, said method comprising activation of an NOR-1 receptor protein in the cell.

23. The apoptosis induction method of claim 22, which comprises the step of contacting a cell with a compound or a prostaglandin having a cyclopentenone structure, which is obtainable by the screening

method of any one of claims 10 to 12.

24. The apoptosis induction method of claim 22 or 23, wherein said cell is an eosinophil cell.

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25. An apoptosis inducing agent, which comprises a compound or a prostaglandin having a cyclopentenone structure, which is obtainable by the screening method of any one of claims 10 to 12.

10 26. An apoptosis-inducing agent comprising a ligand of an NOR-1 receptor as an active ingredient.

15 27. The apoptosis-inducing agent of claim 26, wherein the ligand of an NOR-1 receptor is a prostaglandin having a cyclopentenone structure.

28. The apoptosis-inducing agent of claim 27, wherein the prostaglandin having a cyclopentenone structure is selected from the group consisting of prostaglandin A₂, prostaglandin A₁,
20 16,16-dimethyl prostaglandin A₂, 15(R)-15-methyl prostaglandin A₂, 16-phenoxy tetranor prostaglandin A₂, 17-phenyl trinor prostaglandin A₂, 15-deoxy-delta 12,14-prostaglandin J₂, and 8-iso prostaglandin A₁.

25 29. The apoptosis-inducing agent of claim 26, wherein the ligand of an NOR-1 receptor is any one of the compounds listed in Tables 14 to 58.

30 30. A NOR-1 gene expression-inducing agent, which comprises a ligand of an eosinophil CD30 receptor.